

## BOOK REVIEWS

### Pennell on Scrophulariaceae<sup>1</sup>

A few years ago the late Dr. B. L. Robinson regretted the dearth of thorough and comprehensive monographic studies by American botanists. In this work by Pennell we have a remarkable contribution to this need, written with such sanity, clarity, accuracy and completeness that it would certainly have pleased Dr. Robinson with his well known zeal for detail and precision.

One needs only to read the introductory chapter of forty-five pages to grasp the spirit of the author: originality, without excessive manufacture of either species or varieties; modernism, still with adherence to the traditions of the past; obedience to nomenclatural rules, even though under mild protest; thoroughness, both in the field and the herbarium; and above all an occasional admission of imperfectness in his knowledge which deepens the confidence of the reader in the general accuracy of the book.

The day of old-fashioned taxonomy is past, at least for such countries as the United States. External morphology, derived from herbarium specimens alone, is no longer adequate evidence of specific limitations and relations. Pennell supplements structure with extensive field experience and correlates his results carefully with geographic distribution and floral migrations.

Obviously no critic is competent to discuss the merits of Pennell's concept of species and varieties unless he can rely on a personal experience as broad and as deep as the author's. I doubt if any such person exists. Certainly the keys, which largely replace the conventional descriptions, convey a fine impression of accuracy, of completeness and, especially, of balance and uniformity. There is no impression of "splitting" in one genus and of "lumping" in another. His species all seem to be solid and substantial. They appear to be separated from each other by characters of generally uniform weight. One feels that each one really denotes a definite race of plants.

Pennell's idea of a species is eloquently discussed in his

<sup>1</sup> Pennell, Francis W.: The Scrophulariaceae of eastern temperate North America. Monograph 1. Academy of Natural Sciences of Philadelphia, pp. xiv+650. 155 maps, 43 figures. N. 27, 1935. \$5.00.

introduction. "Although workers in other fields have sometimes urged that species are mere subjective concepts, to taxonomists they are usually surprisingly definite entities." He accepts Du Rietz' definition of species as the "smallest natural populations permanently separated from each other by a distinct discontinuity in the series of biotypes." If there is intergradation between populations, the separate parts of the species are regarded as subspecies, varieties or forms principally on the basis of their geographical distribution, although they are always separable morphologically. His maps illustrate the distribution of each and in many cases they are quite convincing. In some, on the other hand, there is a very marked overlap (e.g. *Lindernia dubia* and *L. dubia major*) and the distinction must have been based primarily on structure.

The nomenclature of minor groups below the species has always been a problem and unfortunately the existing rules scarcely permit full expression of what we believe to be taxonomic relationship. The various components of a species are regarded by Pennell as jointly constituting the species. The bibliographically original element is distinguished by the adjective *typicus*. This word, as Pennell carefully explains, is not a part of the name of the plant, but is merely a Latin adjective appended to it, it has no author's name and cannot be referred to any place of publication. There can be either varieties or forms of a subspecies, depending on their importance, but the author refuses to admit forms of a variety. Thus we may find quadriminomial in use, as *Lindernia dubia major* var. *inundata*, but a quinquenomial is impossible. This is certainly in pleasing contrast to certain recent European work.

The 155 maps which accompany almost every species and subspecies are nothing short of remarkable. There is a dot or other symbol for every locality from which Pennell has seen a specimen. They show not only the general range but also the outlying stations; by their density they indicate abundance or conspicuousness; by lacunae among them they often indicate regions where collecting has been neglected. Correlation between geological or geographical features is clearly indicated by superposed lines, marking, for example, the fall-line, the limits of glaciation, and various other features as needed.

Gray's Manual describes 123 species and named varieties

of the family from the well known manual range. Seventeen of these are not discussed by Pennell, of which eleven are northern and extra-limital, four are introduced and apparently not regarded as established in our flora, and *Paulownia tomentosa* is excluded from the family. Only one remains unaccounted for, *Penstemon acuminatus* Dougl., a name not appearing in Pennell's index. Matching the names in Gray against those in the monograph is not always easy, since the author makes no attempt to include all synonyms and unfortunately neglects a few which are in current usage.

The monograph indicates 131 species or subspecies *typica* and 30 subspecies or varieties in the manual range, which for convenience has been terminated in the west at the Missouri River. This is a net increase of 55, of which seven represent extensions of range, twelve new introductions, one a rediscovery, while the remainder are due to new concepts in the separation of species and varieties. The whole monograph discusses 265 species and minor forms.

In the treatment of genera Pennell departs farther from the usage of current manuals. Instead of the twenty-eight genera (*Paulownia* excluded) of the Manual Range as presented in Gray, we find forty. The following eighteen genera of Gray are unchanged in both name and circumscription: *Verbascum*, *Antirrhinum*, *Collinsia*, *Scrophularia*, *Penstemon*, *Chelone*, *Mimulus*, *Limosella*, *Digitalis*, *Buchnera*, *Castilleja*, *Orthocarpus*, *Melampyrum*, *Euphrasia*, *Odontites*, *Pedicularis*, *Rhinanthus*, *Schwalbea*.

One genus is a new arrival in the region: *Mazus*.

Five genera have had changes of name: *Conobea multifida* (Michx.) Benth. does not belong to the tropical genus *Conobea* Aubl. It becomes *Leucospora multifida* (Michx.) Nutt. *Ilysanthes* Raf. becomes *Lindernia* All. "By the union of the four-anthered *Lindernia* All. and *Vandellia* L. with the two-anthered *Ilysanthes* Raf. and *Bonnaya* Link & Otto is formed a large and clearly natural genus." *Micranthemum micranthemoides* (Nutt.) Wetts. becomes *Hemianthus micranthemoides* Nutt. "The features of calyx, corolla and styles\*\*\* warrant generic status" (apart from *Micranthemum*). *Synthyris Bullii* (Eaton) Heller becomes *Besseya Bullii* (Eaton) Rydb., in accordance with the segregation made by Rydberg. *Seymeria macrophylla* is generi-

cally distinct, under the name *Dasistoma macrophylla* (Nutt.) Raf.

Five remaining genera have been divided as follows: *Linaria* Hill into *Linaria* Miller, *Kickxia* Dumort, *Cymbalaria* Hill, and *Chaenorrhinum* Reich.; *Bacopa* into *Bramia* Lam., *Hydrotrida* Small, *Macuillamia* Raf., *Herpestis* Gaertn., and *Pagesia*, Raf.; *Gratiola* L. into *Gratiola* L. and *Tragiola* Small & Pennell; *Veronica* into *Veronicastrum* Fab. (*Leptandra* Raf.) and *Veronica* L.; *Gerardia* into *Aureolaria* Raf. *Tomanthera* Raf. and *Gerardia* L. emend. Benth. The latter name is adopted according to the International Rules but under protest. It is noteworthy that only two of these, *Hydrotrida* and *Tragiola*, represent new segregations.

The author has examined the material in practically every herbarium of consequence in the country, and in several foreign institutions as well. Each specimen is cited in full, according to state, county, locality, collector, and number. These citations often occupy several pages and extend to several hundred specimens. Surely he has had ample opportunity to test and prove his taxonomic conclusions and the accuracy of his keys.

Many persons probably have the idea that *Verbascum*, with its five anthers and nearly regular corolla, represents a point of contact with the Solanaceae, and therefore the primitive genus of the family. Pennell, on the contrary, regards *Gratiola* and related genera as most primitive because of the separate stigmas and substantiates his view with geographical evidence.

The author concludes his work with a fifty-page discussion of the distribution of plants in eastern America, naturally supporting his views chiefly by the known range of the Scrophulariaceae. This chapter is too full of facts and theories to be capable of adequate review, but it amounts to an excellent résumé of modern distribution, migrations and geographical origin of our flora.

As an appendix, there is an alphabetical list of about a thousand collectors of Scrophulariaceae, naturally including a vast majority of all our field botanists, with dates of birth and death, their chief collecting regions, and the herbaria where their material is chiefly deposited.

The whole book is excellently printed, very free from typographical errors, and so practical that it will doubtless be a



part of the working library of every careful taxonomist. In its general concept and spirit it may well serve as a model for future systematic research.

H. A. GLEASON

NEW YORK BOTANICAL GARDEN

### A new one-volume encyclopedia for gardeners<sup>1</sup>

All growers and lovers of plants will find this volume a treasure house of information. Every variety of plant cultivated in the United States for ornament or for food, as well as most others of economic importance and a large number of native wild flowers, trees and shrubs are given a place here. Arranged alphabetically, the plants are listed under both common and scientific names. For each plant there is a description concise but complete enough, especially as many are illustrated by excellent line drawings, following this are directions for cultivation, lists of fungus and insect enemies with methods of control, and brief descriptions of the species or varieties in cultivation.

Little is said of the parts of the country where different plants may be expected to grow, mention being made merely to hardy or not hardy north, needs much or little water, acid or alkaline soil, etc. Most of the book is of course taken up with descriptions of plants, but besides there are articles on almost any topic the gardener may desire to know about: injurious insects and insecticides; fungi and fungicides; special methods of propagation and culture; the construction of various types of gardens and green houses; kinds of soil and their treatment; fertilizers; dish, window and roof gardens and terraria; birds and their relation to the garden and farm; and a hundred other topics that may be of interest and value. Of birds, besides four and a half pages describing their value in the gardens and means of attracting them, nearly thirty of the more common ones of the east are briefly described in a table giving the characteristic color, markings, size, habits, habitats, nests, food and economic status. Under the last head it is said of the starling: "Highly valued as destroyer of harmful beetles and insects." Certainly there are parts of the country where the starling by

<sup>1</sup> *The Garden Encyclopedia*, edited by E. L. D. Seymour. W. H. Wise and Company, 1936. x+1300, 60 plates, numerous drawings. \$4.00